noting further

that early international harmonization of additional such systems would have many benefits;

invites the Director of the Radiocommunications Bureau

to begin as a matter of urgency studies of the characteristics and spectrum requirements for new transnational terrestrial mobile systems primarily below 1 GHz for public safety applications and to make Recommendations as to technically suitable frequency bands and frequency sharing criteria with a view to completing the studies in time for consideration by the 1997 World Radiocommunication Conference;

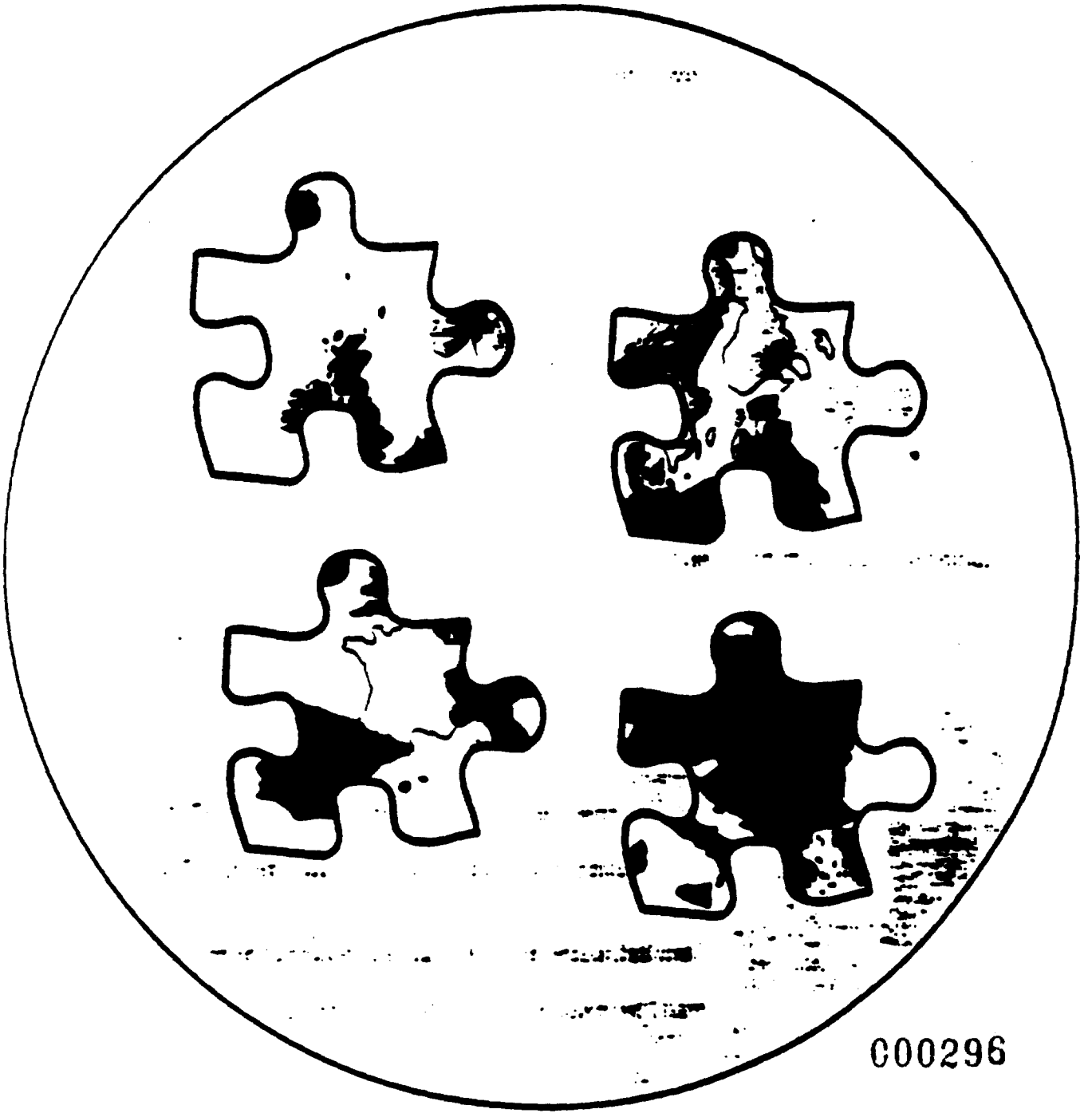
resolves

that the agenda of the 1997 World Radiocommunication Conference should be amended to include consideration of new transnational terrestrial land mobile systems primarily below 1 GHz for public safety applications, including modifications of Article 8 of the Radio Regulations applicable to all three regions, if necessary.

Detailed Spectrum Investigation

Phase II : 29.7 - 960 MHz

The trends and preliminary views



000296

- 450–470 Mhz:

These bands could be designated as candidate bands for future European harmonisation. 30 MHz frequencies and 900 MHz frequencies which are used in some countries for PMR could also be added to this list of bands for future harmonisation.

Depending on the country a maximum of 80 MHz and an average of 50 MHz is currently allocated to professional mobile radio. The comparison between these figures and the estimates concerning future requirements leads to the conclusion that spectrum allocations will have to be approximately doubled within the next 15 years. In other words, an additional allocation of 65 MHz has to be "found" to supplement the existing 50 MHz. It is proposed to focus the investigation on the following bands, with the understanding that the planning goes to the year 2008 or even further:

- 47-68 MHz (Broadcasting Band I)

This band is a candidate band for mobile services. In a number of countries this band is allocated to the mobile service on a permitted basis (see RR, Article 8, footnote 554).

- 68-87.5 MHz

This band is largely used for PMR, either for exclusive national allocations or shared with defence services.

- 146-174 MHz

This band is currently used for PMR and should remain one of the core bands for this service.

- 174-230 MHz (Broadcasting Band III)

This broadcasting band is already used in some countries for land mobile service. It is allocated to the mobile service on a permitted basis in a number of countries (see RR, Article 8, footnotes 621-622).

- 380-400 MHz

Discussions concerning the 380-400 MHz band for TETRA with the present users are not yet finished but it could offer a unique possibility for a harmonised European allocation.

- 410-430 MHz

This band is used for PMR in some European countries, but is also used by military services in other countries with sharing possibilities with PMR in urban areas. This band is included in the CEPT Recommendation T/R 22-05 for TETRA systems.

6.2.1.3 Transport Information and Control Systems ("TICS") - submitted by the Intelligent Transportation Society of America ("ITS America")

ITS America seeks IWG-6 support for inclusion of Resolution No. XXX on the WRC-97 agenda to address international Intelligent Transportation Systems ("ITS") spectrum allocations in the implementation of TICS. Any unresolved issues should be addressed at WRC-99.

In its February 6, 1994 Report and Order in PR Docket 93-61, the FCC established the Transportation Infrastructure Radio Services or "TIRS" "to recognize the expected growth of ITS" and to provide a regulatory framework for spectrum-dependent ITS services. Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, FCC 95-41 (February 6, 1995) at paras. 5-6. The FCC stated:

> Today's creation of TIRS clearly demonstrates this agency's commitment to the continued integration of radio-based technologies into the nation's transportation infrastructure and our commitment to the development and implementation of the nation's intelligent transportation systems of the future.

Id. The applications to be supported by adoption of Resolution XXX are the user services associated with the implementation of the ITS infrastructure and the likely regulation of those services by the FCC as TIRS.

The National Program Plan for ITS, being jointly developed by U.S. DOT and ITS America, calls for the deployment of twenty-nine specific ITS user services. These user services generally are defined in seven categories: (1) travel and transportation management (e.g., traffic control, emissions testing and mitigation, en-route driver information); (2) travel demand management (e.g., pre-trip travel information, ride matching and reservation); (3) public transportation operations (e.g., public travel security, public transportation management); (4) electronic payment services (e.g., electronic toll services); (5) commercial vehicle operations (e.g., hazardous material incident response, on-board safety monitoring, automated roadside safety inspection); (6) emergency management (e.g., emergency notification and personal security, emergency vehicle management); and (7) advanced vehicle control and safety systems (e.g., longitudinal and lateral collision avoidance, intersection collision avoidance, vision enhancement and safety readiness). ITS America anticipates that WRC-97 would consider international spectrum allocations related to these user services or to others that may emerge prior to 1997.

At the core of the challenge facing the ITS community, of course, is the attainment of suitable communications links to ensure the timely aggregation of ITS information and the expeditious and accurate delivery of that information throughout the ITS communications systems to the users. The ITS community is committed to operating within the framework of the National Information Infrastructure, and to using, where appropriate, existing

communications infrastructure and service providers. There are, of course, many issues concerning cost, capacity, competition, privacy and priority that must be addressed by the ITS community.

6.2.1.3.1. Service Allocations or Reallocations Required

ITS America anticipates that some ITS spectrum allocations are likely to be categorized as land mobile services. ITS America anticipates that development of the ITS system architecture, the completion of the National Program Plan for ITS, the completion of ITU-R Study Group 8(a)'s study of international ITS spectrum allocations, the conclusion of FCC Dockets PR 92-235, PR 93-61, ET 94-32, CC 94-102 and ET 94-124, the international discourse at the First, Second and Third ITS World Congresses and other efforts will enable the preparation of the U.S. position on ITS spectrum allocations sufficiently in time for WRC-97.

6.2.1.3.2. Regulatory Issues

The FCC has established the TIRS to provide a framework to regulate spectrum-dependent ITS services. The FCC initially has placed within the TIRS the regulation of Location and Monitoring Systems in the 902-928 MHz band. The FCC has proposed to allocate 3.2 GHz of spectrum (47.2-47.4 GHz, 76.0-77.0 GHz, 94.7-95.7 GHz and 139.0-140.0 GHz) as unlicensed vehicular radar systems band in its on-going ET Docket No. 94-124. The Commission has expressly recognized that the "promise and importance of this technology, and its intended use for public safety purposes" merits "special consideration." Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications (Notice of Proposed Rulemaking), FCC 94-273 (November 8, 1994) at para. 29. The FCC has received proposals for alternative spectrum allocations for unlicensed vehicular radar systems from commenters in ET Docket 94-124. See, e.g., Comments of American Automobile Manufacturers Association, ET Docket 94-124, January 30, 1995.

6.2.1.3.3. Basis for Consideration in the International Radio Conference

The allocation of spectrum to ITS services where necessary, of course, is of paramount importance to the ITS program. The U.S. Congress has established as a national priority the early deployment of ITS services in the U.S. Congress has further expressed its intent in the Intermodal Surface Transportation Efficiency Act of 1991 that the U.S. attain and retain a position of world leadership in the deployment of ITS technologies. These policy imperatives require pro-active U.S. involvement in the international consideration of ITS spectrum allocations which, in turn, mandates that the U.S. advocate the earliest possible consideration of these issues by the ITU, i.e., at WRC-97.

Consideration of international ITS spectrum allocations is further mandated by both international compatibility and safety concerns. The automobile markets are well established

beyond national boundaries. Moreover, travel by automobile across national borders is commonplace. Accordingly, ITS equipment deployed in automobiles, for example, likely must accommodate multi-national infrastructures. ITS America is working closely with ERTICO, its European counterpart, and VERTIS, its Asian counterpart, among others, on these issues. International compatibility in ITS spectrum allocations indeed was a prime topic at the recently-concluded First Annual ITS World Congress in Paris and no doubt will be the subject of much work at subsequent ITS World Congresses.

6.2.1.3.4. United States' Interest in Supporting the Item

In adopting the Intermodal Surface Transportation Efficiency Act of 1991 ("ISTEA") Congress established as a national priority the implementation of a nationwide Intelligent Vehicle-Highway infrastructure.[4] Among other goals, Congress clearly articulated its expectation that ITS services and technologies would save lives and improve traffic safety, reduce traffic congestion, improve environmental quality particularly in non-attainment areas under the Clean Air Act and enhance mobility and economic productivity. In addition, Congress determined that U.S. leadership in the development and deployment of ITS technologies would enhance U.S. industrial and economic competitiveness "by establishing a significant United States presence in an emerging field of technology."

The importance of the ISTEA goals cannot be overstated. In ITS America's Strategic Plan, experts have estimated that ITS can reduce traffic fatalities by eight percent by 2011. That is, 3,300 lives saved and 400,000 injuries avoided each year at current traffic levels. These figures, however, could prove to be quite conservative. ITS is expected to relieve traffic congestion in the U.S. by up to twenty percent in the most heavily traveled corridors, and to alleviate congestion resulting from roadway construction and maintenance and accidents in rural as well as urban areas. The enhancement in economic productivity in the U.S. resulting from the deployment of ITS has been estimated at $100 billion annually. Infrastructure investment in ITS over the next twenty years is estimated in excess of $200 billion, eighty percent of which will be private sector investment. ITS clearly will generate thousands of new, high technology, high paying jobs. We believe that the public benefits that will result from the early deployment of ITS in the U.S. are truly compelling.

As directed by Congress in ISTEA, the goals of the ITS program are improving traffic safety, reducing traffic congestion, enhancing mobility and capturing economic productivity now lost, improving environmental quality through reduced emissions, particularly in non-attainment areas under the Clean Air Act and enhancing U.S. competitiveness in emerging technology markets.

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[4]Intermodal Surface Transportation Efficiency Act of 1991, Pub. L. 102-240, §6052.

6.2.1.3.5. Candidate Spectrum Bands

ITS America anticipates that development of the ITS system architecture, the completion of the National Program Plan for ITS, the completion of ITU-R Study Group 8(a)'s study of international ITS spectrum allocations, the conclusion of FCC Dockets PR 92-235, PR 93-61, ET 94-32, CC 94-102 and ET 94-124, the international discourse at the First, Second and Third ITS World Congresses and other efforts will enable the preparation of the U.S. position on ITS spectrum allocations sufficiently in time for WRC-97.

6.2.1.3.6. Sharing Issues

LMS in the 902-928 MHz band shares its spectrum with ISM, Government and amateur radio use and with Part 15 devices. Sharing studies will be conducted as required.

6.2.1.3.7. Related Study Groups, Reports and Studies

ITU-R Study Group 8, with the support of nineteen member nations, is considering Study Question 51/8 concerning international spectrum issues for Transport Information and Control Systems. Although this Question was supported by many member nations, a U.S. representative serves as the Rapporteur for the TICS Correspondence Group. Adoption of Resolution No. XXX in the Final Report of IWG-6 will be fully consonant with such U.S. leadership and will permit consideration of any recommendations of the Study Group at the earliest possible moment.

6.2.1.3.8. Relevant Federal Government Activities

The FCC currently is considering a number of Dockets that concern ITS-related services, including PR Docket 93-61, PR Docket 94-32, CC Docket 94-102 and ET Docket 94-124. ITS America anticipates that these Dockets will be completed in sufficient time to enable consideration of their outcomes at WRC-97.

USDOT has selected the architecture teams led by Loral and Rockwell to continue with Phase II of the Architecture selection. Phase II will be completed no later than mid-1996 and a national ITS architecture will be identified at that time.

USDOT has funded numerous ITS operational tests. Many State Departments of Transportation have also funded ITS operational tests. Many of these tests, including for example the "TravTek" test in Orlando, Florida have been concluded and their results are known; many others will conclude well before 1997. USDOT is expected to continue funding further operational tests.

USDOT has funded a "communications alternatives" study by ARINC to identify and investigate the communications links available for ITS user services. ARINC's study is

expected to be concluded in sufficient time for consideration of its conclusions in formation of the U.S. position at WRC-97.

RESOLUTION NO. XXX

Frequency Provisions for Development and Implementation of New Transportation Related Radiocommunications

The 1995 World Radiocommunication Conference

considering

a) that there is a need to integrate new technologies including radiocommunications into land transportation systems;

b) that Transport Information and Control Systems are being planned and implemented by many Administrations;

c) that international standards would facilitate the world-wide implementation of these systems and provide for economies of scale in bringing equipment and services to the public;

d) that the developments now in progress in different portions of the frequency spectrum may require common frequency bands in the future for efficient frequency utilization;

noting

a) that the Radiocommunications Sector has adopted Study Question 51/8 concerning Transport Information and Control Systems;

b) that the Radiocommunications Sector is engaged in studies that include the technical characteristics, sharing criteria and spectrum requirements for these systems;

c) that the Radiocommunications Sector has resolved to complete these studies by 1997;

invites the Director of the Radiocommunications Bureau

to continue as a matter of urgency its studies of the characteristics and spectrum requirements for the Transport Information and Control Systems, to make Recommendations as to the technically suitable frequency bands, associated standards and frequency sharing criteria with a view to complete its studies before the 1997 World Radiocommunication Conference;

resolves

that the agenda of the 1997 World Radiocommunications Conference should be amended to include consideration of the spectrum requirements for the Transport Information and Control Systems and if necessary, modifications of Article 8 of the Radio Regulations.

6.2.1.4 Proposal for Use of the 5.2 GHz MLS Extension Band for High Speed Wireless Data System - Submitted by AT&T[5]

6.2.1.4.1. Introduction

AT&T proposes that an additional allocation of the band 5000-5250 MHz to the Mobile service at WRC-97 for use by high speed data and multi-media applications, referred to as high speed wireless data systems ("HSWDS"), is in the best interest of US industry and users. This is addressed in more detail below.

This recommendation is made after consideration of the reassessment by the FAA of its needs for the MLS extension band and the obvious interests of the mobile satellite services in this band for their feeder links.

Already, Europe has set a precedent with the "high speed wireless LAN" Recommendation of CEPT (T/R 22-06) in which 5150 - 5250 MHz was provided as a harmonized allocation.

In addition, CEPT allocated 5250-5300 MHz on a national basis. We have looked at bands up to 40 GHz. There are no other bands below 17 GHz where 100 MHz of contiguous bandwidth is available. Higher bands where wider bandwidths may be available are unsuitable for high speed wireless data systems. Additionally we believe this service will be desired on a global basis and that harmonization with Europe would enhance opportunities for US industry to compete effectively on the European market as well as providing additional opportunities for users in world-wide deployment of HSWDS systems.

Work done on high speed wireless data systems has focused on the provision of short range radio links operating at a bit rate in excess of 20 Mb/s and requiring a channel width in the order of 20 MHz and a maximum of 1 watt transmitter power. 250 MHz of spectrum will provide users with radio networks with an aggregate capacity of 150 Mb/s/10,000 m2 (hectare), a value that allows wireless multi-media services to be deployed effectively.

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[5] There was substantial objection by Loral/QUALCOMM to the submission by IWG-6 of AT&T's proposal to the Commission. (See discussion below). Comsat Mobile Communications joins Loral/QUALCOMM in opposing AT&T's proposal.

Sharing studies by ETSI and by British Telecom in cooperation with UK Department of Trade and Industry - both with inputs from INMARSAT and GLOBALSTAR - indicate that sharing between the MSS feeder uplinks and high speed wireless data networks is possible. Typical separation distances required are in the order of 5 to 30 miles. If typical earth station siting considerations are observed such as avoiding highly populated areas, including avoiding proximity to business or academic campuses, any interference into the wireless data service should be incidental and manageable. Details of these studies, in which AT&T participated, are available and can be provided upon request.

6.2.1.4.2. Justification of high speed data wireless systems

6.2.1.4.2.1 User Needs

With the increased use of computers in all walks of life, the need for data transmission at high (data) rates becomes stronger. Wired networks are rapidly increasing their data rates viz. 100 Mb/s Ethernet and 155 Mb/s ATM switching networks. The increasing need for data communications has become very much visible in the debate around the National Information Infrastructure.

At the same time, computing is moving away from number crunching to human oriented, interactive systems with multi-media interfaces to the user in which data, text, image and sound are combined. These systems require much higher bandwidths than their predecessors.

With computers becoming more portable and more widely used, the demand for wireless data transmission systems that serve to link the mobile user to the high speed wired networks of his surroundings will increase apace. Where a few Mb/s today serve to demonstrate the feasibility of such transmission systems, users already demand more bandwidth for their wireless data applications. The expected rise of multi-media computing will only increase this demand.

Studies have shown that in typical office environments an overall capacity of 150 Mb/s/hectare will be needed to support a realistic mix of applications, including multi-media services.

Finally it should be pointed out that the high speed wireless data systems envisioned would be natural "extensions" to the National Information Infrastructure, notably as used by business and industry.

6.2.1.4.2.2 Existing Regulations

The recent years have seen the explosive growth in mobile communications - also for data applications. Working within the constraints of the Part 15 rules for the ISM bands, the industry has developed products that are proving to serve a large market demand and it has

started a broad effort to standardize wireless data systems (see IEEE P802.11). This shows a strong demand from users that want to access data networks at any place and at anytime without being hindered by the need for a physical connection. However, the Part 15 rules - by demanding the use of spread spectrum transmission techniques - limit the achievable data rate to a few Mb/s.

The request (RM7618) from Apple Computer led to the work in WINForum to develop a broad etiquette for access to the Unlicensed (UPCS) PCS bands. This work in WINForum is reflected in the Commission's rules applicable to the two 10 MHz bands allocated to unlicensed PCS. The resulting regulations are likely to stimulate low cost applications such as wireless for personal digital assistants and similar devices in the UPCS band. However, really high speed wireless systems (i.e. with bit rates exceeding the default norm of Ethernet which is 10 Mb/s) are not possible under these rules nor are multi-media transmission services possible.

The need for truly high speed wireless data networking has been recognized in Europe where CEPT, in 1991, allocated the 5.2 GHz band to "HIPERLAN", a catch phrase for a radio local area network supporting a wide range of applications (including multi-media) at bit rates in excess of 20 Mb/s and over distance of about 50 meters. CEPT ruled that only those systems conforming to a to be developed air interface standard (ETSI HIPERLAN) would be allowed to operate in this band without a license. This policy of a generous spectrum allocation and absence of uncontrolled interference encourages industry to invest in technology that delivers high performance. In the US no equivalent spectrum is available nor do comparable rulings exist for access to unlicensed spectrum.

6.2.1.4.3. Usage of High Speed Wireless Data Systems

6.2.1.4.3.1 Background

High speed wireless data communications have a wide range of applications. The following is a short summary.

High speed wireless data networks typically use radio networking between computer systems. These networks provide high speed, short distance radio links between computer systems of all kinds on a many to many basis. Typically, such networks will be used for local, in-house and on-premises networking that support mobile users as well as stationary ones.

Note that "mobile" is used above in a different meaning from mobile as used conventionally. The former focuses on private, indoor networking, something that is not covered by the latter. As traditionally understood, mobile communications includes portable radios, car phones and personal radio telephones and cellular "mobile" telecommunications systems provided by a very much (public) service oriented industry. Seen in a broad perspective of radio facilities, high speed wireless LANs represent one end, the high

performance/short range end, of a spectrum of untethered computer communications. At the other end are the wide area mobile systems such as Cellular, PCS and FPLMTS that promise world-wide access at a much lower throughput and at far higher cost per bit. Whereas the high speed wireless data systems are typically unlicensed private systems with a coverage limited to local premises, PCS and similar systems are typically public, licensed services, owned and operated by service providers.

6.2.1.4.3.2 Applications

The applications of high speed wireless data systems cover a wide range of business, administrative and professional usage. The following list provides examples. As high speed wireless LAN technology becomes widely available other uses and applications will emerge which will further increase the use of this technology. A major opportunity for high speed wireless data systems is to provide wireless access to the National Information Infrastructure ("NII"). The NII will be able to deliver large volumes of data at high speeds to end-users. Freeing end users of the need to connect to a fixed access point will significantly increase the usefulness and attractiveness of the NII. The applications of high speed wireless data systems cover almost the whole spectrum of business and administrative activity. Therefore, there is a very large potential market for such systems. Market research indicates a market potential of nine million units world-wide by 1995 for "mobile" data communications. A large part of these will be wireless data systems with the share of high speed wireless data systems increasing with time.

6.2.1.4.3.2.1 Office Automation

General office automation covers a wide range of administrative applications. Changes in office organization such as emphasis on work groups leads to demands for flexibility in the location of professional and supportive staff. In addition, the increased complexity of administrative and management tasks leads to frequent ad-hoc meetings at which people would wish to make use of their computers to capture and to exchange information.

6.2.1.4.3.2.2 Financial Services

The financial industry is moving from over an over-the-counter cash orientation towards more personalized services covering a range of financial products. Putting the customer in the center of their business requires financial institutions to rethink the physical design of their offices. Mobile computer use plays a large role in achieving the required flexibility.

6.2.1.4.3.2.3 Medical and Hospital Systems

In all developed countries medical care and hospitalization are becoming exceedingly expensive. These costs are caused in part by the complexity of medical systems, patient care

and medication. The efficiency of medical staff can be improved by giving them on the spot, real time access, to patient data, x-ray images, video recordings, medical records, etc. Only a high speed wireless data system can provide the span of performance needed.

6.2.1.4.3.2.4 Education and Training

Computers and networks in particular are being used increasingly in education and training both in schools and colleges and in the workplace. High speed wireless data systems will greatly enhance the facilities that can be offered as well as the flexibility of their provision. This includes the distribution of teaching material, interaction with teachers, sharing of assignments and research results, etc. Wired systems can never provide the flexibility needed in educational institutions.

6.2.1.4.3.2.5 Industrial Automation

Industrial systems have been using computers for many years. In many cases the systems concerned are centralized: a few computers control a large number of machine tools, conveyor systems, etc. With the increasing use of microprocessor technology and with the trend towards flexible production systems, more computing power will be pushed down to the work floor. This will be paralleled by an increased need for more ad-hoc networking between production floor systems. Radio based networks are ideal for these applications.

6.2.1.4.3.2.6 Ad-hoc Networking

A very important class of high speed wireless data system applications are those in which no fixed structure exists. Rather, groups of mobile users (e.g. using laptop PCs) may form, dissolve and reform so-called ad-hoc networks as required. For example a number of experts may meet at a certain place and decide to network their portable computers temporarily. Such networks are most likely to occur in education and training environments where computers are shared between many different but also in collaborative environments such as team problem solving, collaborative project groups, inter- as well as intra-governmental meetings, etc.

6.2.1.4.4. Benefits for the public

Note: the benefits listed here derive primarily from the ability to support on portable computers complex applications that require large bandwidths to communicate with other computers, networks and databases.

6.2.1.4.4.1 Increased freedom of action of computer users

Wireless communications for computers means that computer users are not limited to using their machines only close to a network connection. This will improve the motivation of people to use their computers in places and under conditions that were not possible before.

This will not only bring direct benefits to the users but it will also lead to the emergence of new (software) products and new service industries that cater to the "mobile" computer users.

6.2.1.4.4.2 Increased efficiency of service providers

With the increasing complexity of business and services, computers have become indispensable tools for all kinds of service providers. The trend towards more personalized services can bring additional benefits if the service providers can apply wireless computing to support their staff.

6.2.1.4.4.3 Better education

Already computers are becoming mandatory in some schools. Wireless networking will greatly improve their use. Wireless computing can reduce the cost of delivering educational data to students, increase their motivation (it's interactive) and involvement in the subjects they study. Similarly, on the job training becomes more efficient and continuous education while working becomes a real possibility.

6.2.1.4.4.4 Better health care

The cost of health care is rapidly increasing. Cost reductions and efficiency improvements are required. These lead to the possibility of reduced quality of health care services. Wireless computing can help reduce these effects and increase staff efficiency by providing them with access to whatever data they need and by providing them with the means to exchange data with others while at work on the hospital floor.

6.2.1.4.4.5 Increased efficiency of "white collar" workers

Most white collar workers spend a large part of their time away from their desk. At the same time, computer support is becoming indispensable in all trades, including general administration. Much of the work done away from the desk has to be redone later, at the desk. The ability to share large volumes of information efficiently with others and independently of ones' own desk will greatly increase the efficiency of many white collar workers.

6.2.1.4.4.6 Increased efficiency of maintenance and repair workers

The complexity of technology makes manuals for maintenance and repair almost useless. Portable computers and wireless networking can give these workers the ability to service even the most complex equipment in shorter times. This increased efficiency will be reflected in higher reliability and improved life cycle cost of major systems.

6.2.1.4.5. Benefits for US industry

6.2.1.4.5.1 A large home market for advanced technology products

Freeing spectrum in the US that can support high speed data and multi-media services creates a large home market for products that support these services. These products require advanced technological solutions to the problems of data transmission in order to deliver the performance demanded by the user community. US industry will be more willing to make the necessary investments if they are assured of a large home market.

6.2.1.4.5.2 Improved efficiency and competitiveness

The application of high speed wireless networks promises to improve the efficiency of people in all occupations from maintenance workers to management. This, in turn, will lead to higher output and lower product costs. Both factors will increase the competitiveness of US industry in general world markets.

6.2.1.4.5.3 Competition on equal footing in high speed wireless markets

With Europe having shown the way, other countries are likely to follow with spectrum for high speed data transmission. This creates a large market in which US industry has to compete with their international peers. European manufacturers have the advantage of a single market, controlled by pan-European regulations. Without a comparable home market, US industry will be at a comparative disadvantage.

6.2.1.4.6. ITU - R Activity

ITU - R SG9 has been working on a Draft New Recommendation for Radio Local Area Networks (RLANs) through the 1990-1994 study period. The application in this proposal is included in that work, currently in the Preliminary Draft Recommendation in document 9B/Temp 3, dated 3 November 1994 related to high speed, high performance RLANs. While this work is currently in progress in ITU-R SG9 there is recognition that this application may be more properly considered a mobile service. It is anticipated that future work regarding this application would be conducted in ITU-R SG8. It should be noted that RR 797B (Mob-87) already provides an additional primary allocation of the band 5150-5250 MHz to the mobile service in a number of countries in Europe, North Africa and the Middle East.

* * * * *

Loral/QUALCOMM's Opposition to AT&T's Proposal

AT&T has submitted a proposal to IWG-6 (Document IWG 6/3A) which asks that the United States recommend for inclusion on the WRC-97 agenda the allocation of a portion of the 5000-5250 MHz band for high speed wireless data systems. AT&T, in its proposal, states that Europe has set a precedent with the "high speed wireless LAN," (also referred to as HIPERLANS) recommendation of CEPT (T/R 22-06) for the use of the 5150-5250 MHz band as a "harmonized" allocation. In addition, AT&T states that "CEPT has allocated 5250-5300 MHz on a national basis for high speed wireless LANs." [It is noted that only administrations, not CEPT, allocate spectrum.] It is also noted that some European administrations are permitting the implementation of HIPERLANS on an unlicensed basis, and have not given any indication of seeking formal allocations at WRC-97.

Recommendation Concerning the Proposal to include high speed wireless LANS in 5 GHz on the WRC-97 Agenda

The United States should not seek to add an agenda item for WRC-97 relating to an allocation for high speed wireless data systems in any portion of the 5000-5250 MHz band. The allocation of spectrum for such services can be addressed on a national basis, if desired (in countries to which the mobile services allocation applies). It should be the position of the United States that high speed wireless LANs operate on an unlicensed basis, without the need for co-primary allocations which would require extensive coordination between the LANS and other allocations, including aeronautical radionavigation, and with NGSO MSS feeder links, assuming an allocation is made at WRC-95 for the fixed-satellite service (Earth-to-space) for NGSO MSS feeder uplinks. The WRC-95 Industry Advisory Committee should not put forward a proposal which could undermine U.S. efforts at WRC-95 to attain suitable NGSO MSS feeder link allocations and confuse other administrations concerning U.S. objectives with regard to the 5 GHz band.

Background

One of the key agenda items for WRC-95 is the allocation of spectrum for NGSO MSS feeder links. A number of U.S. NGSO MSS systems, as well as other systems, including "INMARSAT-P," require a feeder link allocation at WRC-95 in order to proceed with system construction and implementation. Loral/QUALCOMM Partnership, L.P., ("LQP"), Constellation Communications, Inc., and INMARSAT-P all propose to use feeder links in the 5000-5250 MHz range. LQP holds a license from the Federal Communications Commission ("FCC"), to construct, launch and operate a non-geostationary 48-satellite constellation and to provide domestic and international communications service. The user link bands authorized are 1610-1626.5/2483.5-2500 MHz and the feeder links, conditionally authorized, are 5025-5225 MHz/6875-7075 MHz. The feeder links are conditionally authorized, pending the outcome of WRC-95 to allocate the 5000-5250 MHz bands for

NGSO MSS feeder links in the Earth-to-space direction and to permit FSS in the space-to-Earth direction for NGSO MSS feeder links in the 6875-7075 MHz band. INMARSAT-P has advanced published with the ITU Radio Registration Board for the use of a portion of the 5000-5250 MHz band for feeder links in the Earth-to-space direction.

LQP has been working closely with the United States government, including the FCC, NTIA, FAA and the U.S. Department of State, to analyze the sharing situation between NGSO MSS feeder links (Earth-to-space) and aeronautical radionavigation systems, including MLS, in the 5000-5250 MHz band and to work with the international community concerning the allocation at WRC-95. Comsat, as well, has devoted considerable resources to this issue.

In addition, LQP has been working within U.S. preparations for meetings of the International Civil Aviation Organization ("ICAO") to ensure that ICAO's position on the use of the 5000-5250 MHz band is consistent with the proposed feeder link allocation. LQP also has sought the support of ICAO, with regard to a reconfiguration of the MLS plan, which would provide for more spectrum in this band for NGSO MSS feeder links which could be used on a non-overlapping basis with MLS.

The FCC, in its Second Notice of Inquiry, in preparation for WRC-95, proposes the following revisions to the allocations relating to 5000-5250 MHz:

MHz
4800 - 5725

MOD

Allocation To Services		
Region 1	Region 2	Region 3
5000 - 5250	AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE SERVICE (Earth-to-space) 797C 733 MOD 796 797 797B	
797D		

NOC 733 The bands 1 610-1 626.5 MHz, 5 000-5 250 MHz and 15.4-15.7 GHz are also allocated to the aeronautical mobile-satellite (R) service on a primary basis. Such use is subject to agreement obtained under the procedure set forth in Article 14.

NOC 797B

MOD 796 The band 5030 - 5091 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. Future operations of MLS may extend into the 5000 - 5030 MHz band. Administrations should attempt to satisfy the needs of MLS in the 5030 - 5091 MHz band before expansion into the 5000 - 5030 MHz band. After January 1, 2015, the microwave landing system may also operate in the band 5091 - 5120 MHz, if the requirements of the system in support of precision approach and landing cannot be met in the 5000 - 5030 and 5030 - 5091 MHz bands. In the event that microwave landing system operations extend beyond the 5030 - 5091 MHz band, the requirements of this system shall take precedence over other uses of the occupied bands.

MOD 797

SUP 797A

ADD 797C The use of the band 5000 - 5250 MHz (Earth-to-space) and 15.4 - 15.7 GHz (Earth-to-space) by the fixed-satellite service is limited to feeder links for non-geostationary satellite systems of the mobile-satellite service.

ADD 797D The use of the band 5000 - 5250 MHz (Earth-to-space) by the fixed-satellite service is subject to the application of the coordination and notification procedures set forth in Resolution 46 [suitably modified], for coordination between non-geostationary satellite networks (Earth-to-space) and between non-geostationary satellite networks (Earth-to-space) and terrestrial services.

Reason: To allocate spectrum specifically for feeder links to support mobile-satellite services provided from non-geostationary satellite networks. Suppression/revision of Nos. 797 and 797A are consequential. Modification of No. 796 incorporates the alternative MLS expansion plan discussed internationally and articulates the transition plan with initial expansion (subject to need) into the 5000 - 5030 MHz band and subsequent expansion (subject to need) into the 5091 - 5120 MHz band.

The Commission, in the Second Notice, also notes that ITU-R Task Groups 8/3 and 4/5 "have analyzed the sharing situation between MLS and NGSO MSS feeder links and have indicated that sharing may be feasible given certain constraints." Second Notice, p. 29, at Note 5.

IWG-4 of the WRC-95 Industry Advisory Committee, in its Interim Report, also proposes that the United States propose the allocation of 5000-5250 MHz on a co-primary basis, for NGSO MSS feeder links, subject to appropriate sharing arrangements with MLS.

Document IWG 4-14(Rev.1), August 16, 1994, provides extensive analysis of the ability of NGSO MSS feeder uplinks to share with both MLS and other types of aeronautical radionavigation systems.

Discussion - Why the U.S. Should Not Propose an Agenda Item for WRC-97 Addressing International Allocation for High Speed Wireless LANs in the 5.2 GHz Band

The Commission, in adopting its licensing and service rules for Big LEO systems, stated that [T]his new mobile satellite service -- the "MSS Above 1 GHz" or "Big LEO" satellite service -- has the potential to provide not only a variety of new services to users in the United States, but to provide integrated communication services to all parts of the world, including those that are now grossly underserved." Big LEO Rules Order, 9 FCC Rcd 5936 (1994), at para. 1. The Commission also noted that feeder links are integral to the operation of MSS systems. Supra, at para. 163. Moreover, the Commission stated that "the 5000-5250 MHz and 15.4-15.7 GHz frequencies appear to be promising candidates for reallocation for LEO feeder links." Supra, at para. 168. The Commission further noted that TG 4/5 was of the preliminary view that sharing of non-GSO feeder links with Aeronautical Radionavigation Services (ARNS) in these bands appeared feasible.

The authorization of the Big LEO systems has been a long-fought and hard won battle, involving more than four years of domestic and international efforts, as well as an extensive and technical negotiated rulemaking proceeding. With regard to INMARSAT-P, the creation of the separate organization for the purposes of implementing NGSO MSS service is the result of years of effort to understand the market, technology and user needs. The Big LEO systems will enable the provision of telecommunications service to unserved and underserved areas, and will reap enormous benefits for manufacturers, service providers, as well as telecommunications users.

The high speed wireless data systems also will bring about economic, business and social benefits. These systems have demonstrated that they can operate on a low-power, unlicensed basis. The need for an allocation has not been demonstrated to enable the implementation of these systems.

Analyses conducted thus far demonstrate that high speed wireless data systems are unlikely to cause harmful interference into NGSO MSS systems. See, ITU-R Document TG 4-5/85, 8 November 1994 and ITU-R Document TG 4-5/TEMP/39-E, 29 November 1994. Sharing analyses, however, have noted that separation distances may be required to prevent interference from NGSO feeder uplinks into the wireless data networks. If the HIPERLAN allocation issue is injected into WRC-95, for the purposes of placing it on the agenda for WRC-97, while key decisions on the use of the 5000-5250 MHz band are pending, the resulting confusion could potentially damage the U.S. efforts to obtain feeder link allocations.

Consideration of an international allocation for the high speed wireless data networks is neither wise nor necessary. First, the allocation of the 5000-5250 MHz band for NGSO feeder links has not yet been accomplished but is likely to be a primary U.S. objective for WRC-95. The issues of coordinating with ARNS, including MLS, have consumed considerable private and public resources. Although high speed wireless LANS may be able to operate in this band on an unlicensed basis, seeking the consideration of an allocation for the service at WRC-97 (1) could undercut the U.S. efforts at WRC-95 to obtain the vitally needed allocations for NGSO MSS feeder links; (2) might have the prospect of limiting the location of NGSO MSS feeder link earth stations, which may be subject to siting constraints in order to share with ARNS; (3) might unduly expose NGSO MSS feeder link earth station operators with obligations to consider locations so as to limit potential interference to high-speed wireless LANS -- which could conceivably operate virtually anywhere; and (4) has not been subject to a United States domestic proceeding, review by the United States government, and an opportunity for review and comment by United States interests.

AT&T indicates that some other services may be allocated spectrum in the 5000-5250 MHz band, thus preempting HIPERLANS from obtaining an allocation. Thus far, no other services have been proposed for allocation, and no sharing studies performed. Furthermore, the United States has considerable time to take preventative action if such a situation arises since sharing studies with MSS feeder links will need to be performed before any allocation proposal is made.

Moreover, it is highly premature to suggest an agenda item addressing additional allocations for the 5.2 GHz band without any sharing analyses with aeronautical radionavigation systems.

Conclusion

The WRC-95 Industry Advisory Committee should not put forward a proposal that the United States seek an agenda item for WRC-97 which addresses the use of the 5.2 GHz band for an allocation for high speed wireless LANs.

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AT&T's Response to Loral/QUALCOMM's Opposition to its Proposal to Include an Allocation for High Speed Wireless Data Systems on the Agenda for WRC-97

AT&T does not consider that the opposition of Loral/QUALCOMM to its proposal, that the United States recommend for inclusion on the WRC-97 agenda an additional allocation in the 5000-5250 MHz band to accommodate High Speed Wireless Data Services, has raised any issues of substance that endanger the proposed feeder link allocation for MSS in that band or that might call into question the public interest that would be served by the allocation proposed by AT&T.

Loral/QUALCOMM (Section I) is correct that administrations and not CEPT allocate spectrum. The administrations participating in CEPT have provided an allocation in harmonization in order to promote the deployment of high speed wireless LANs.

In its background statement (Section III) Loral/QUALCOMM states that feeder links for its system in the band 5025-5225 are conditionally authorized. AT&T agrees that the band has been proposed, identified or recommended for use as NGSO MSS feeder links, but questions whether these are conditionally authorized for use by Loral/QUALCOMM. AT&T does not question the amount of work, detailed in Section III that Loral/QUALCOMM has put into securing the present prospect of an allocation for MSS feeder links in the band in question, but does not believe that work precludes any other service from seeking to share the band, especially when preliminary studies have indicated that there will be no interference into MSS earth to space feeder links which is the direction proposed in the FCC's Second Notice of Inquiry.

Loral/QUALCOMM recognizes in Section IV that these high speed wireless data systems will bring about economic, business and social benefits, but nevertheless states that the need for an allocation has not been demonstrated. It is true that the proposed service could be provided in the U.S. without an international allocation, if the FCC would approve such a petition. However, the advantages of a worldwide allocation to U.S. manufacturers and to international travelers accessing business or academic databases would provide even greater benefits. Some of these include economies of scale, large markets, compatibility of terminals and ability to accommodate international applications. There is the additional concern that without an allocation of spectrum to for support of high speed wireless data systems, these systems would have no status or protection that could prevent the allocation of this spectrum to another additional service that was not compatible and could not equitably share the band. Were this to occur, the investment made by manufacturers and users of these systems would be negated.

In Section IV, Loral/QUALCOMM acknowledges that it is unlikely that these high speed wireless data systems will cause harmful interference into NGSO MSS systems, but is concerned that separation distances may be required to prevent interference from NGSO feeder uplinks into the wireless data networks. Considering the many siting considerations that would go into placement of a NGSO feeder link earth stations for both uplink and downlink operation, notably to protect downlink operations from man-made noise prevalent in highly populated areas, it is highly unlikely that they would be located in such areas, and would avoid proximity to industrial, business and dense residential areas. Therefore, given such siting administration, AT&T considers that, in practical situations, the interference from MSS feeder link earth stations experienced by users of high speed wireless data systems will typically be localized and/or incidental and manageable.

In Section IV, Loral/QUALCOMM further states that it believes this proposal would undercut U.S. efforts at WRC-95 to obtain allocations for NGSO feeder links. AT&T does

not consider this proposal for the WRC-97 agenda a threat to U.S. efforts at WRC-95 for MSS feeder links and believes the concern is unwarranted.

Loral/QUALCOMM's final point in Section IV is that this proposal is premature without any sharing analysis with aeronautical radionavigation systems. Sharing analysis with aeronautical radionavigation systems has been conducted with a result that co-channel, co-geographical sharing is not feasible. We therefore have supported in our comments the FCC's proposal in its Second Notice of Inquiry for MOD 796, also supported by Loral/QUALCOMM, which limits the spectrum in 5000-5250MHz band likely to be used by the aeronautical radionavigation service.

AT&T urges IWG-6 to recommend its proposal for the agenda for WRC-97 as no argument of substance has been presented.

6.2.2. Proposals from other IWGs

6.2.2.1 IWG-3 Referral of MSS Items

6.2.2.1.1 Revise Res. 46 as gain experience with non-GSO MSS

6.2.2.1.2 Review effect of RR2613 with regard to implementation

6.2.2.1.3 Review MSS service link spectrum requirements at 1-3 GHz and MSS feeder link spectrum requirements

Resolves 3.1 - unresolved and other pressing issues concerning frequency allocation and regulatory aspects as related to the mobile-satellite services, including additional allocations for service links and feeder links for mobile-satellite services as appropriate.

6.2.2.2 IWG-5 Referrals

In considering items for future WRCs, IWG-5 referred an item concerning allocations for active space-based sensors. There was industry support (by Teledesic) for an additional intersatellite service (ISS) allocation at 65-71 GHz, but other parts of the proposal referred from IWG-5 were not supported by IWG-6, principally because space based sensor allocations were not considered to be an industry issue. IWG-6 believes that the argument for allocation modifications and use of frequencies by government agencies is more appropriately advanced through the Radio Conference Subcommittee of the IRAC.

6.2.3 Items from WRC-93 Preliminary Agenda for WRC-97

The Final Acts of the WRC-93, Geneva, 1993 contain Resolution 2 which is the Preliminary Agenda for the 1997 WRC.

6.2.3.1 Items to be endorsed

Resolution 2 in its resolves 1-8 sets forth various possible items for this forthcoming conference. As a matter of record, while not precluding other agenda items, IWG-6 endorses the maintaining on this agenda the following items:

a. Resolves 2.2 - Recommendation 66 (Rev. WARC-92), 621 (WARC-92), 711 and 715(orb-88).

6.2.3.2 Recommended deletions

6.2.3.2.1 None.

6.2.4 Items outstanding from WRC-93 Recommendations/ Resolutions

6.3 Preliminary Agenda for WRC-99

6.3.1 Identify carry-over proposals from WRC-97

6.3.2 New proposals

6.3.2.1 Proposal for International Amateur Radio Permit - Submitted by The American Radio Relay League, Inc.

6.3.2.1.1. International Amateur Radio Permit

The Commission is urged to propose the following agenda item for WRC-99:

(*resolves*)

"to consider the adoption of an international amateur radio permit to allow international roaming by duly licensed amateurs among signatory countries;"

Reason: The executive committee of the Inter-American Telecommunication Commission ("COM/CITEL") has approved an international amateur radio permit for submission to the General Assembly of the Organization of American States for adoption within the Americas. European countries currently permit international roaming within signatory countries under CEPT Recommendation T/R 61-01. There are also numerous

bilateral agreements permitting international roaming by amateurs. The objective is to provide one global mechanism to permit such international roaming.

6.3.2.1.2. 7 MHz Realignment

At WARC-92, the United States proposed the Realignment of the bands around 7 MHz to harmonize the HF broadcasting allocations and to allocate 300 kHz of spectrum worldwide to the amateur service. The 300 kHz worldwide band for the amateur service was not on the WARC-92 agenda, but it might have been possible to accomplish it as a consequence of expanded HFBC allocations. It was determined that the adjustments in HFBC allocations did not provide sufficient consequence for the Realignment of the amateur allocation, thus it was not possible at WARC-92.

Upon proposal of the Mexican delegation, WARC-92 adopted Recommendation No. 718: Alignment of Allocations in the 7 MHz Band Allocated to the Amateur Service, which

recommends:

that a future competent world administrative radio conference should consider the possibility of aligning the allocations of the amateur service around 7 MHz, with due regard to the requirements of other services; and

invites the Administrative Council:

to place this Recommendation on the agenda of the next competent world administrative radio conference.

While CEPT countries had not developed common proposals or positions at WARC-92, it is understood that subsequent discussions within CEPT are more supportive of a realignment of amateur and broadcasting bands around 7 MHz that would result in a 300 kHz band worldwide for the amateur service. Nevertheless, there does not appear to be sufficient support for 300 kHz at 7 MHz for the amateur service until there has been some movement out of the HF bands, such as to satellites. This is expected to occur around the year 2001 or thereafter. Thus, we recommend that the 7 MHz Realignment not be proposed as an agenda item before WRC-01 or until such time that there is sufficient support of a majority of countries.